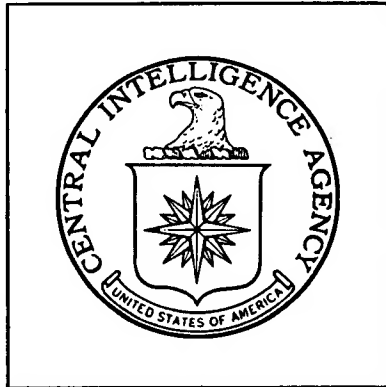


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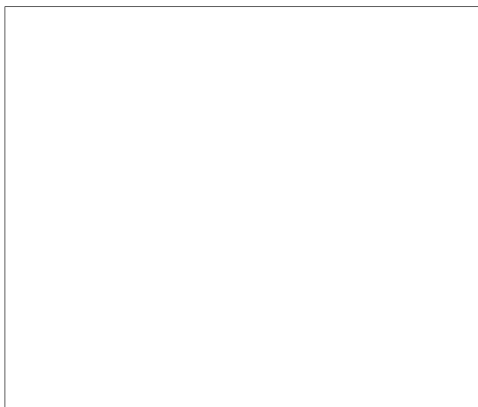
**DIRECTORATE OF
INTELLIGENCE**

**Missile Ranges
Naval Launched Facilities**

Basic Imagery Interpretation Report

Balaklava Missile Test Center, USSR

(BE Name: Balaklava Coastal Defense Test Site, Cruise Missile)



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DATE December 1969

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CENTRAL INTELLIGENCE AGENCY
Directorate of Intelligence
Imagery Analysis Service

December 1969

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INSTALLATION OR ACTIVITY NAME		COUNTRY
Balaklava Coastal Defense Test Site, Cruise Missile*		UR
UTM COORDINATES	GEOGRAPHIC COORDINATES	
--	44-30-25N 33-31-53E	
MAP REFERENCE		
2 RTS. USATC, Series 200, M0250-25HL, 6th ed, Nov 68, Scale 1:200,000 (SECRET)		
LATEST IMAGERY USED	NEGATION DATE (If required)	
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* Based on the results of this study, action is being initiated to change the name of this installation to Balaklava Missile Test Center.

ABSTRACT

Photographic analysis indicates that the facility known as the Balaklava Coastal Defense Test Site, Cruise Missile has been involved for a number of years in research and development of both naval ballistic and cruise missile weapon systems. The role of Balaklava in cruise missile testing has been generally accepted for some time, but its involvement in ballistic missile testing is published for the first time in this report.

The installation presently consists of seven separate areas, of which four are believed to support ballistic missile testing. These four are a probable ballistic missile pop-up test facility, a liquid propellant service area, a bunkered missile storage area, and a primary monitoring and control facility. In addition, there are a cruise missile launch area and base support facility, as well as a missile assembly and handling facility which probably supports both ballistic and cruise missile testing operations. Most of the cruise missile facilities at the center were present when the area was first photographed in 1956, whereas all of the ballistic missile facilities have been built since 1959.

The facility which we believe is probably for underwater pop-up tests of submarine launched ballistic missiles is generally similar to the US pop-up missile test facilities at San Clemente Island in California. The equipment to support such tests may have been present at Balaklava as early as 1960, and was certainly there by the end of 1961. The early testing possibly involved the SS-N-5. Although there is no direct photographic confirmation of this, the SS-N-5 is the only underwater launched ballistic missile known to have been under development at that time. In 1964, preparations were begun for a second series of tests. These included an expansion of the ballistic missile support facilities and the installation of new testing equipment in the probable pop-up

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test facility. Sightings of SS-N-6 equipment have been made on several occasions at Balaklava beginning in 1966. On this basis, we believe that the second series of tests was associated with the SS-N-6 missile program. Activities observed in the area in late 1969 suggest either development of a third ballistic missile system or extensive modification to an existing system.

Considering the size and extent of its facilities, the Balaklava installation may be the primary short-range cruise missile test center in the USSR. Samlet cruise missiles have been identified there since 1964. In addition, two new cruise missiles have been observed at the test center and its associated open storage area since April 1966.

INTRODUCTION

The Balaklava Missile Test Center is located 6 nautical miles (nm) south of Sevastopol, USSR. It is situated along the edge of a high cliff overlooking the Black Sea (Figure 1). Security consists of a triple fencing around five of the seven areas at the installation.

The SS-N-6 submarine launched ballistic missile and the Samlet coastal defense cruise missile are the only two known weapons systems identified at the center to date. There are indications, however, that possibly two other ballistic missile systems and two other cruise missile systems have been tested there.

This report is based on a review of all photographic coverage of the Balaklava facilities from July 1956 through November 1969. The analysis is limited somewhat by the fact that there was very little large-scale coverage of Balaklava prior to 1968.

NOTE: This report has been published as an Interim Basic Imagery Interpretation Report with the concurrence of the National Photographic Interpretation Center.

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BASIC DESCRIPTIONProbable Ballistic Missile Facilities

The probable ballistic missile facilities at Balaklava consist of a probable ballistic missile pop-up test facility, a liquid propellant service area, a bunkered missile storage area, a primary monitoring and control facility, and a missile assembly and handling facility which probably supports both ballistic and cruise missile testing operations.

Probable Pop-Up Test Facility

The probable ballistic missile pop-up test facility, located in a small cove below the Balaklava cliffs, consists of two sets of four large stabilizer buoys of unusual configuration (see Figure 2). The buoys are positioned approximately 1,700 feet from the shoreline, in water about 100 feet deep. This facility is probably used to test the ascent of a missile launched underwater to that point where it has cleared the water and the first stage engines would ignite.

Several smaller circular buoys of two sizes are also located in the area and at least two of these have been noted inside the western set of stabilizer buoys. These small buoys probably provide a close-in mooring capability for support vessels. They may also serve to suspend underwater high speed cameras and acoustic detection equipment or provide a support base for special wave measurement instruments.

Probable Pop-Up Test Equipment

The stabilizer buoys, the possible ballistic missile launch device, and certain other equipment used at Balaklava were apparently constructed at Nosenko Shipyard 444 at Nikolayevsk. This equipment has also been seen at various times at the Balaklava Submarine Base and Ship Repair Yard (hereafter referred to as Balaklava Submarine Base) which appears to provide general support to the Balaklava Missile Test Center.

Stabilizer Buoys. The first set of uniquely configured stabilizer buoys was installed in the probable ballistic missile pop-up test facility at Balaklava in August and September 1964. In August 1966, a single stabilizer buoy of the same type was observed at Balaklava Submarine Base (Figure 3) and by June 1968 it had been installed at the probable pop-up

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facility. Three more buoys of this type were seen in varying stages of construction at Nosenko Shipyard 444 between October 1966 and April 1968. In August 1968, they were seen at the shipyard lashed together ready for transport. In September 1968, three identical buoys had been installed at the probable pop-up test facility, thereby completing the second set of buoys.

Possible Launch Device. During the same general time that the last set of stabilizer buoys was being constructed at Nosenko, two unidentified floating structures were under construction on a quay in the shipyard. One of these seemed slightly larger than the other and appeared to have a cylindrical object positioned in its center. Considering the appearance of these structures and the fact that similar structures were later seen along with stabilizer buoys at Balaklava Submarine Base, we believe that the structure with the cylindrical object in the center may be an underwater launch device used for ballistic missile pop-up tests (Figures 3 and 4). The possible underwater launch device was present at Nosenko Shipyard 444 until the summer of 1967. On [] it was floating beside the quay and on [] it had been removed. A similar structure, probably the same one, was seen at Balaklava Submarine Base for the first time in April 1968, moored alongside a stabilizer buoy and two of the floating structures without cylindrical objects (Figure 3).

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Other Floating Equipment. The floating structures without the cylindrical object are probably used in support of underwater launch activities, although their role is not known. Three of these structures have been observed to date -- one at Nosenko Shipyard 444 and two others at the Balaklava Submarine Base. The structure seen at Nosenko Shipyard 444 was completed and in the water in June 1968. By August 1968 it had been removed from the shipyard at Nikolayev, but as recently as June 1969 was not evident in the Balaklava area. The two structures observed at the submarine base were probably associated with earlier underwater test programs since one was probably present there in July 1964 and could not be negated. The second one first appeared in August 1966, but was not present in July 1965.

Shipborne Support Elements

Various types of vessels have been seen near the probable ballistic missile pop-up test facility on many occasions. The T-43 Class MSF (minesweeper) and small tugboats have been seen most often. In March 1968 a W-Class submarine was moored beside a large floating crane adjacent to the test area. A similar submarine and crane were later seen at the Balaklava Submarine Base located 3 nm east of the missile test center. In June 1962 an unidentified surface vessel was seen tethered to an unidentified object in the center of the stabilizer buoys (Figure 5). The

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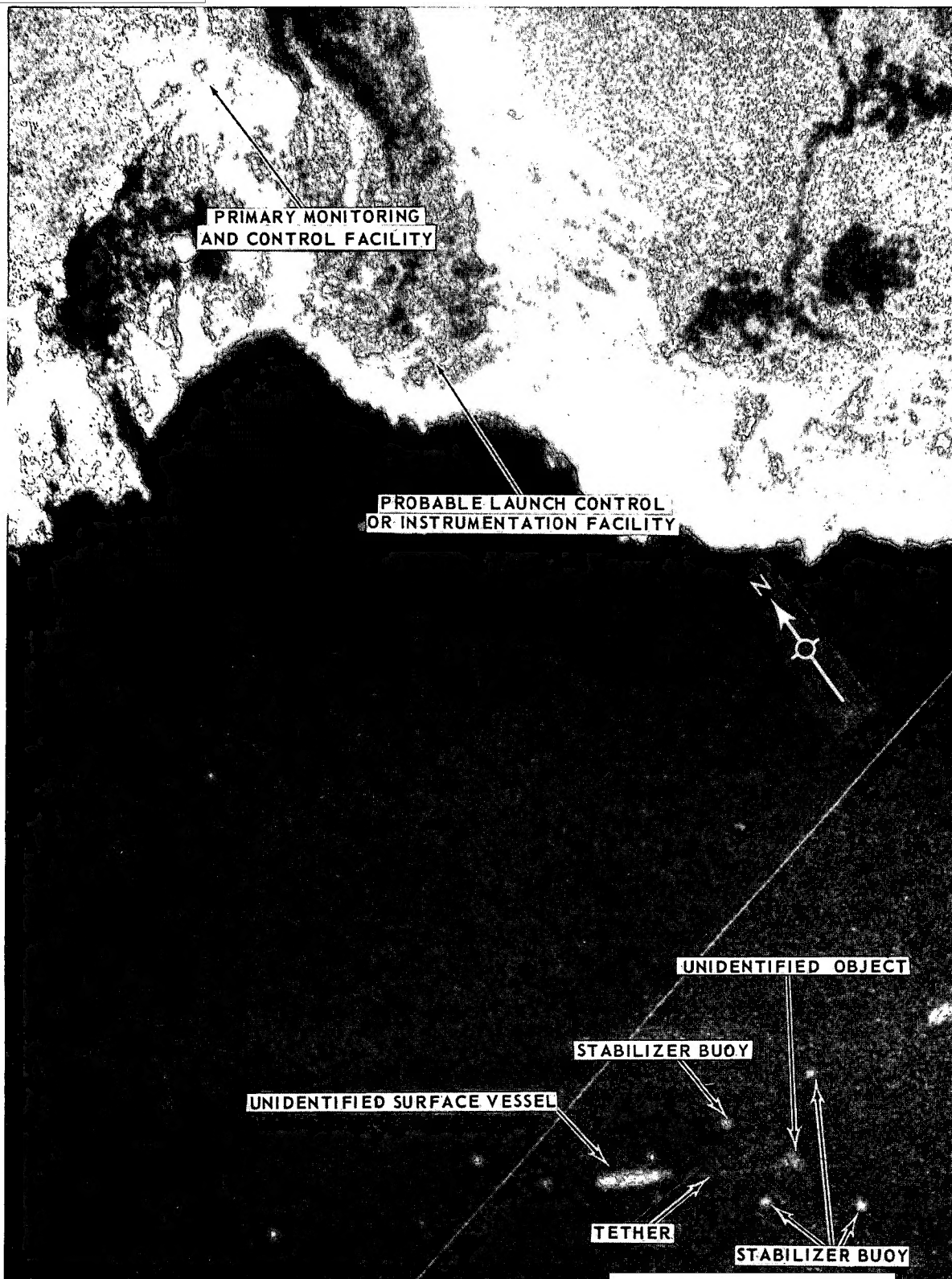


FIGURE 5. PROBABLE POP-UP TEST IN PROGRESS

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unidentified object could have been part of the probable pop-up test facility, perhaps a launch device, and the presence of the vessel suggests that a test was probably in progress.

Shore Based Instrumentation and Monitoring Facilities

A probable launch control or instrumentation facility consisting of two buildings is located on the shoreline directly opposite the probable ballistic missile pop-up test facility (Figure 6). At least one and probably two large underwater cables extend from one of the buildings into the water, toward the probable pop-up test facility.

Along the cliff edge directly above the probable launch control or instrumentation facility is the primary monitoring and control facility, Instrumentation Site 6. This facility consists of a control building with a possible instrumentation component on its roof, as well as a probable instrumentation building and small unidentified probable instrumentation device which are cable-connected to the main control building. Three small probable optical devices are mounted on the ground in front of the main control building. Just west of the building is a large open storage or instrumentation area containing varying amounts of van-mounted telemetry antennas, support vans, and unidentified pieces of equipment.

In addition to Instrumentation Site 6, there are five other instrumentation sites along the cliff edge which are probably associated with missile pop-up tests (see Figure 1). Instrumentation Sites 3 and 9 are nearly identical; each contains two enclosed optical devices, one unidentified possible optical component, one probable camera mount, a Shipwheel radar position and several supporting vans and generator units. Instrumentation Sites 5, 7, and 8 each consist of a small probable optical device.

Similarity to U.S. Navy Test Facilities

Identification of the probable ballistic missile pop-up test facility at Balaklava is based mainly on its general similarity to the San Clemente Island Range of the United States Navy Underseas Warfare Center. The San Clemente Island Range conducted the initial pop-up tests for the Polaris missile between 1957 and 1964.

The probable pop-up facilities at Balaklava differ in some respects from those at San Clemente, but the types of facilities and their general arrangement are similar at the two locations. Like Balaklava, the San Clemente operations area is located in relatively shallow water below a high bluff. The surface components used for Polaris pop-up testing consisted of some ten large stabilizer buoys, tethered together, which supported

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a large net. The net served to catch the dummy missile when it fell back toward the water following a pop-up test. Numerous smaller buoys were used to suspend instrumentation units near the pop-up device. A floating crane and other surface vessels were also present from time to time. Several instrumentation sites were placed above the operations area on the bluff, in position to monitor the tests.

Missile Handling and Support Facilities

Facilities providing logistic support to the probable ballistic missile test program consist of a liquid propellant service area, a missile assembly and handling facility, and a bunkered missile storage area. A large base support facility, constructed primarily to support the cruise missile program, was subsequently enlarged and probably also provides some support for the probable ballistic missile program.

The present liquid propellant service area has been constructed adjacent to the original propellant facility at Balaklava. The area now consists of two large service aprons like those at Nenoksa Missile Test Center and Severodvinsk Naval Missile Support Facility, two identical oxidizer storage sheds, and two buried probable fuel tanks. Each of the service aprons is individually secured and a lightning arrestor is located near each oxidizer storage shed. The area also contains two small probable propellant sheds and a probable water storage tank which remain from the original facility, but are probably no longer in use (Figure 7).

At various times, SS-N-6 missile equipment has been observed on photography on both the loop service road and the east service apron of the liquid propellant service area. Propellant transporters, KRAZ-214 propellant servicing vehicles, and several unidentified transporter semitrailers have also been observed here.

The missile assembly and handling facility is separately secured and consists of three large and one small drive-through buildings, one drive-into building, and six other buildings. An SS-N-6 missile dolly was seen here in June 1969. A small mobile crane and several unidentified vans have been seen here intermittently since August 1966.

The missile storage area is separately secured and consists of three bunkered drive-through missile storage buildings, one small bunkered missile component storage building, one security building, and a power plant (Figure 1). It is not clear from their appearance alone whether the storage bunkers are associated with either cruise missiles or ballistic missiles. However, their construction timing (detailed in a later paragraph) and location near the liquid propellant service area, where only ballistic missile equipment has been seen, suggest that their primary role is in support of ballistic missile testing.

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Chronological Development

Original Facilities. The support facilities for the probable ballistic missile test program at Balaklava were first observed under construction in February 1960. Construction had probably started sometime in 1959. None of the probable ballistic missile test facilities were present on the only previous photographic coverage of the area in July 1956.

In February 1960, the primary monitoring and control building was under construction and the missile assembly and handling facility was being expanded. The original propellant service area and three drive-through bunkered missile storage buildings were being constructed.

The first set of four stabilizer buoys was observed in position in December 1961. They were not present in February 1960.

The time of construction of the original probable ballistic missile test facilities indicates that Balaklava may have been involved with the initial pop-up testing of the SS-N-5, which was the only underwater launched ballistic missile known to have been under development at that time.

Expansion of Facilities. During the 1963-66 time period, the probable ballistic missile test facilities at Balaklava underwent a major expansion. It now seems likely that the expansion was associated with testing of the SS-N-6 submarine launched ballistic missile.

By mid-1963 Instrumentation Sites 3, 5, 8, 9 and part of Site 7 were under construction; they appeared complete in mid-1964. During August and September 1964, a second set of four stabilizer buoys was emplaced just west of the original buoys. The new buoys were distinctly different in appearance from the original ones. Each new stabilizer buoy consisted of four tanks lashed together, whereas the original stabilizer buoys were rectangular in shape and probably consisted of a platform supported by several tanks (Figure 3). Dismantling of the original set of buoys had started in December 1964, but was not complete until June 1967.

Expansion of the liquid propellant service area was begun in 1965. The area could have been partially operational late in 1965 and was probably complete by June 1966.

In April 1966, construction was noted at the primary monitoring and control facility and the missile assembly and handling facility. By August 1966, the monitoring and control building had been nearly doubled in size and two small buildings had been constructed near it. The small drive-in building at the missile assembly and handling facility was also completed at that time. In August 1966 a canvas-covered SS-N-6 and an SS-N-6 missile dolly were seen in the liquid propellant service area for the first time.

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During 1967 Instrumentation Sites 3 and 9 appeared to have been connected by a cable ditch to the primary monitoring and control facility.

In 1968 two unidentified transporter semitrailers, one canvas covered and without a prime mover, were seen on intermittent occasions at the propellant service area (Figure 7). Although the semitrailers appeared slightly different, due to the canvas covering, they were probably the same. In June 1968, emplacement of another set of stabilizer buoys was started at the same location where the original buoys had been placed. By September all four buoys were in place.

Timing of SS-N-6 Program. Based on the expansion of the probable ballistic missile test facilities at Balaklava in the 1963-66 period and the sightings of SS-N-6 equipment there beginning in 1966, Balaklava is believed to have conducted pop-up tests of the SS-N-6 missile. Initial pop-up tests of the liquid-fueled SS-N-6 may have begun as early as the fall of 1965 when the liquid propellant service area was expanded.

Actual test firings of the SS-N-6 were conducted at Kapustin Yar Missile Test Center. Construction of the launch area for the SS-N-6 at Kapustin Yar began in early 1965 and was probably completed in the fall of 1965. The first reported firing of the SS-N-6 from Kapustin Yar, however, did not occur until September 1966. Final evaluation of the SS-N-6 probably occurred at the White Sea Test Range, beginning in August 1967.

Possible New Test Program. Some of the activities observed during 1968 suggest that a new test program, perhaps involving a new underwater launched ballistic missile system, may already have begun at Balaklava. This evidence includes the installation of the third set of stabilizer buoys, the presence of an unidentified semitrailer and transporter at the liquid propellant service area, and the presence of the possible launch device at Balaklava Submarine Base. If the transporter semitrailers at the liquid propellant service area are in fact valid indicators, they suggest that any new ballistic missile undergoing tests at Balaklava is at least partially liquid fueled. It is possible that some of the activities at Balaklava may be related to the June 1969 firing of a new naval ballistic missile from Nenoksa Missile Test Center.

Cruise Missile Facilities

The cruise missile test facilities at Balaklava consist of a launch area with two uniquely configured launch pads, part of the large missile assembly and handling facility which also serves the ballistic missile program, and the base support facility which contains a large administration and support area and an open storage area. Originally, the Balaklava facility was considered to be an operational cruise missile launch site, but since April 1968 photographic analysis has indicated that it conducts cruise missile testing.

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FIGURE 9. CRUISE MISSILE OPEN STORAGE AREA,

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Launch Area

The Balaklava cruise missile launch area is separately secured. It contains two elliptical, unrevetted concrete pads which are periodically mottled with disruptive paint (Figure 8). Their size, appearance, approach-ways, and proximity to one another are all dissimilar to an operational Samlet cruise missile launch area. No missiles have ever been seen in the launch area.

Immediately to the rear of the launch pads are a probable guidance area and several small unoccupied possible optical instrumentation positions. A large drive-through, bunkered missile handling building and one small drive-through, separately secured checkout building are also associated with the launch area.

Support and Instrumentation Facilities

The missile assembly and handling facility is separately secured and consists of two large drive-through buildings which were originally constructed to support the cruise missile program. The facility has been doubled in size since 1960, when the ballistic missile program was probably introduced at Balaklava (Figure 8). The base support facility is separately secured and located west of the primary monitoring and control facility. It consists of four multistory administration-type buildings, several barracks, numerous workshops, a large motor pool, an open storage area, a military personnel obstacle course, and numerous athletic fields.

Instrumentation Site 1 was apparently constructed for a limited series of tests. It consists of several van-mounted unidentified antennas positioned on five pads near the edge of the cliff. It was built in 1963 and appeared to be abandoned in early 1967. Its location suggests that its function may have been to monitor a vehicle launched from a surface vessel.

Instrumentation Sites 2, 4, and 7 were present prior to the advent of the ballistic missile program and are probably associated with cruise missile activities (Figure 1). A Sheet Bend/Square Head radar van has been seen at various times at Instrumentation Site 2. Instrumentation Site 4 probably consisted of an optical instrumentation component, but the site has not been seen active from 1960 to the present. Instrumentation Site 7 consists of two small buildings, at least one of which possibly houses optical equipment, and a small hardstand which is periodically occupied by an unidentified van. This site may monitor both cruise missile and ballistic missile activity.

Cruise Missiles Observed

The cruise missiles observed at Balaklava have all been located in the open storage area of the base support facility (see Figure 9). To date, three different types of cruise missiles have been observed there. Two Samlet missiles, one canvas-covered Samlet on a transporter, and an associated tower-mounted radar have been observed at various times since 1964. In addition, a

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small swept-wing probable cruise missile, resembling the Samlet, and a delta-wing probable cruise missile have been observed on several occasions beginning in April 1966. The following is a summary of the cruise missiles observed on large-scale photography in the open storage area:

<u>Date</u>	<u>Samlet Missiles</u>	<u>Swept-Wing Missiles</u>	<u>Delta-Wing Missiles</u>
Apr 64	3	None discernible	None discernible
Apr 66	3	3	
Sep 66	3	3	
Mar 67	3		
Jun 67	3		*
Aug 67	3		*
Dec 67	3	0	*
Mar 68	3	0	*
Aug 68	3	0	*
Sep 68	3		*
Mar 69	3		*
Apr 69	3		*
Jun 69	3		*
Aug 69	3		*

* Wings folded or removed

The small swept-wing probable cruise missile is approximately 15 feet long and has a wing span of about 9 feet. It has been collocated with a [] inclined probable launcher, and on several occasions one of these missiles was resting on the launcher (Figure 9). Most of the cruise missile activity has evidently involved this missile, judging by fluctuations in the number sighted since 1966.

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The delta-wing probable cruise missile is approximately [] and has a [] wingspan. It is unlike any other known Soviet cruise missile. No vans or other equipment have been collocated with it.

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Because of the small scale of the photography prior to 1966, it has not been possible to determine how long either of these new configuration missiles have been present.

Numerous van trailers, trucks, cranes and one unidentified approximately [] probable shipping crate have also been seen in the open storage area.

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25X1Chronological Development

The launch pads, the missile assembly and handling facility, and the base support facility were present and operational when first seen on overhead photography in July 1956. This indicates that cruise missile tests were conducted at Balaklava prior to that time. The cruise missile facilities were being expanded in February 1960 when a bunkered missile handling building was under construction. By December 1961 all construction appeared complete. Relatively minor changes occurred until June 1963 when the base support facility was expanded to include a new administration building and the open storage area. Instrumentation Site I was under construction during the summer of 1963.

Samlet equipment was first identified at the open storage area in April 1964. Instrumentation Site I was occupied in June 1964. Little activity was noted throughout 1965.

Large-scale photography of April 1966 revealed the delta- and swept-wing probable cruise missiles and one missile checkout and support van trailer in the open storage area. Several new buildings were added in the base support facility during 1966. Vans were still present at Instrumentation Site I during 1966. Very little change was noted throughout the cruise missile support facilities from March 1967 through September 1968. In January 1969 a complete rearrangement of missiles and equipment occurred in the open storage area, but no new components were added.

Requirement

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Project Number 050408
Support Number 420335

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